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LANDSCAPES IN FINLAND

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If, on our first visit to Finland, we enter that country thru the well protected port of Helsinki (Helsingfors) we may gain the impression that the nation is modernized thruout, for this capital city presents a striking picture of progress. On the other hand, if we sail thru the magnificent, coniferous forest-covered Åland archipelago off the southwest coast of Finland and set foot on the mainland at Åbo (Turku) we might wonder whether all Finnish urban life is similar to that in our own small towns. Buildings are low except for the imposing medieval castle and cathedral and a scattering of business and public structures three or four stories high. Should we chance to be traveling in northern Sweden and then decide to visit Finland we might cross the international boundary between Haparanda in Sweden and Tornio in Finland. A long low wooden bridge across the mouth of the sluggish Torne River where it enters the Gulf of Bothnia, is the highway which carries one into rural Tornio, a town which reminds us of our frontier communities. The back country is quickly visited by a short walk from the center of town to the outskirts. At this point we are likely to inquire whether Finland is mostly a wilderness.

Each of these avenues of approach presents a different image—each one true in itself but none characteristic of the country as a whole. In this land of "A Thousand Lakes"* whose area (150,150 square miles) is less than four times that of Ohio and whose population (3,800,000) is roughly one-half that of New York City, we can see striking contrasts in natural and cultural landscapes. These are worth observing with special reference to their relation to each other. Thus, we may secure an appreciation of the way in

* The actual number of lakes is in excess of 40,000.

18°
22°
26°
30°
34°
ARCTIC OCEAN
Mt. Haltiatunturi
(Mt. Halde)
68°
Tornio
GULF OF BOTHNIA
64°
Vaasa
THE VAASA PLAIN
Kuopio
KARELIAN
DISTRICT
Tampere
L. Pyhäjärvi
THE SALPAUSSELKÄ
Enso
LAKE
LADOGA
Åland
Turku
Viipuri
60°
Archipelago
Helsinki
Hanko
GULF OF FINLAND
0 50 100
Scale of Miles
22°
East of 26° Greenwich
30°

Fig. 1.

which the peoples of Finland have adjusted themselves to the natural elements of the region which they have occupied for more than eighteen centuries.

Rural Landscapes in Other Parts of Finland

We can gain a concrete impression of a rural landscape in western and southwestern Finland by looking at a typical farm

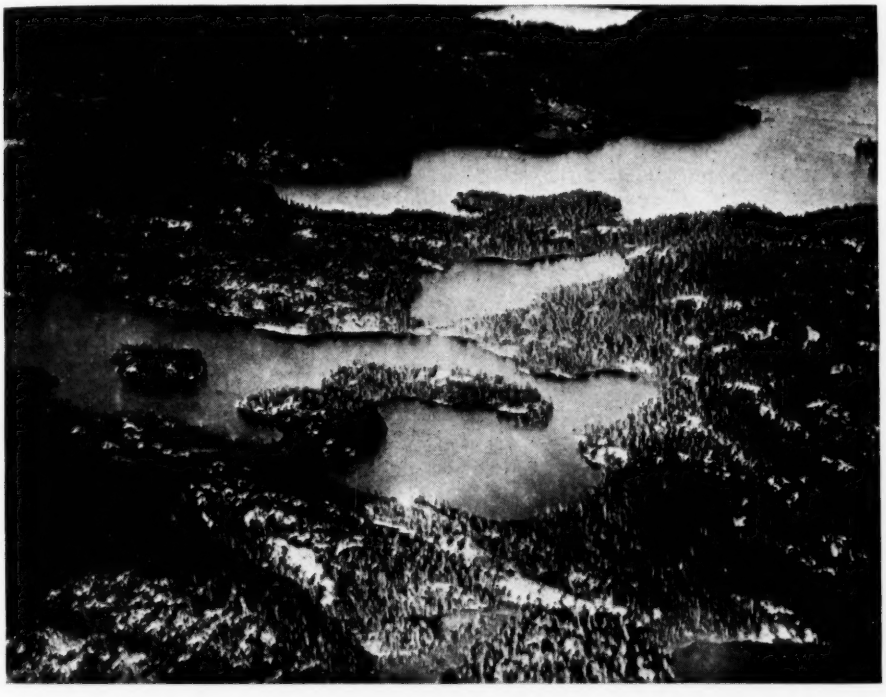

Fig. 2. A Portion of the Central Lake District. Much of Finland is typified by a lake and forest landscape. The wealth of the nation is in its forests which are so carefully conserved that the annual supply of timber is maintained at a constant amount.

in the Vaasa district. This farm occupies a twenty-five acre area of well drained slightly rolling land overlooking a river. Every farmer in Finland endeavors to have some water frontage, either river or lake. Whenever possible, he selects a rise in the land upon which to erect his buildings, especially his residence from which he enjoys a sweeping vista over the surrounding countryside.

If our visit is timed for the summer season, we shall see hay, oats, rye, potatoes, and woodland as the dominant crops, and some pasture land. Woodland is listed here as a crop because the laws

of Finland, require every farmer to maintain a certain percentage of his land in trees for fire-wood. This law grows out of the fact that the country contains no coal. As the farmer cuts timber for fuel, he sets out new trees. So, he actually harvests a tree crop, but unlike the annual cereals, the trees mature only every fifteen to twenty years. Rye provides a cash crop and also is the source of flour for a tasty hard disc-like bread. Potatoes constitute a dependable cheap food supply and the hay and pasture land gives support to the most important of all the agricultural industries of Finland, namely dairying.

Distributed over the hay and grain plots are crossbars, about three feet high, placed in long precise rows. The harvested crops are hung upon them and are thus exposed to the circulating air. Finland's atmosphere usually has a high humidity and rains are frequent. The hay barn is constructed in response to these same humid conditions. Its log sides slope from the roof in toward the log floor, the logs being spaced several inches apart to allow for air circulation.

Clustered Farm Buildings

Not only does the trim appearance of the farmland interest us, but our attention is attracted to the cluster of buildings characteristic of Finnish farms. We see a horse and cow barn, a tool house, the primitive log cabin in which an earlier family lived when the farm was first established, a wood shed, a storage house for foods and a bath-house. Several of the buildings are connected by covered passageways so that during rainy weather, or in severe snowstorms during the long winter, communication between the buildings is maintained without requiring members of the family or hired farm hands to expose themselves to the weather elements.

Altho the number of buildings varies on different farms, virtually no farm is without its steam bath house, an inconspicuous feature in the rural landscape, but none-the-less important. Evidence of the fact that a Finn is bathing is furnished by the curls of smoke or steam usually escaping thru structural cracks and other openings, in a building about ten feet square and eight to ten feet high giving the impression when seen at a distance of a shack on fire. Especially Saturday afternoons during the cold seasons and almost every evening during the summer, one may view from a height overlooking the country-side, many pillars of

smoke piercing the still atmosphere, each marking the location of a farm and serving as notice that bathing is in progress.

The bath house usually is built of logs, altho some very modern types are of planed timber. Within is a stone stove made from glaciated boulders, gathered from the land about, for there are myriads of such boulders strewn nearly everywhere over Finland's glaciated surface. The bath house may be built upon the river

Fig. 3. Bleak Finnish Lapland. Uninviting as this landscape seems to be, it has an important economic value in its support of a limited forest, provision for grazing lands for reindeer, and minor mineral deposits which give promise of developing into considerable proportions.

bank or lake shore, so as to provide a convenient cold water reservoir into which the bather may plunge after he has been exposed to the steam within the house.

The Lake District

Let us now begin a tour eastward from the Vaasa agricultural till plain toward the province called Karelia. En route we quickly find ourselves in the heart of an extensive lake and swamp district

making up the greater part of the 65 per cent of Finland which is classified as wet. This region also includes most of the lake area which occupies 11.5 per cent of the total area of Finland. The lakes for the most part are fringed by stately stands of spruce, pine, or birch. Similar forest types grow on the intervening land areas. Relatively little of this region is under the plow. Here and there occurs a small clearing supporting a struggling farmer and only once in a while may be seen cultivated lands which remind one of the prosperity of western Finland.

As we approach the town of Kuopio the terrain becomes increasingly irregular and reaches heights here and there of about 500 feet above the surrounding area or about 775 feet above sea level. From Puijo Hill, the highest hill, at the base of which lies Kuopio with its rectangular pattern, a majestic panorama of lake, forest, and hill spreads out as far as one can see and wins the admiration of those who appreciate a landscape which combines a bit of civilization and a suggestion of the wild. Miles and miles of pine, spruce, and some alder trees, rise from the surfaces of boulder-strewn moraines, eskers, low drumlins and till plains sending to the eye variegated shades of color ranging from the green of the spectrum nearly to black. In contrast with the green background, white trunks of graceful birches appear here and there reflecting, as it were, the silvery sparkle of sunlight from the intervening water surfaces.

THE KARELIAN SCENE

Continuing eastward to the forested hills of Karelia where lakes diminish in number, we secure glimpses of bare rock exposures, rocks which rank among the oldest geologically. Agricultural lands scattered thru these forested areas are even poorer than in the central districts. Here farming often means merely earning a scant existence. Homes for the most part are log cabins, and farm equipment consists largely of wood plows, wood sledges for hauling crops and other loads over wet or stony surfaces. The peasant farmers are practically self-sufficient, making not only their crude implements but their clothing, household utensils, and many other necessary items. However, difficult as is their struggle, these substantial farmers, like those elsewhere in Finland, seek out morainic or rocky heights as the sites for their numerous yet primitive buildings so that even tho they are poor in material things they may satisfy their love for broad vistas across an inspiring northern

landscape—a landscape relieved from drabness by a profusion of brilliantly colored wild flowers, fairly lighting up the meadows and forest clearings with carpets of pink fireweed, white oxeye daisies and bluebells as blue as the heavens.

Northern Finland

Northward, from the cross-section which we have just traversed, into northern Finland, lakes become fewer, in some localities of the

Fig. 4. A portion of the public market in Helsinki. In the foreground is a section of the fish market and in the background the fruit and vegetable market. Meats, poultry and dairy products are sold in an area to the right not included in this view. This market place is on the water front and at the head of the Esplanade—Helsinki's "main street." The market place is always a congregating point for the city's population and reveals not only a cross section of the characteristics of the people but also the nature of the commodities which appeal to them. Since many of the sellers come from the nearby countryside, their products tell the story of the kinds of commodities yielded by the city's environment.

northeast there being none at all. Along the eastern border, hills take on more or less mountainous proportions, occasionally reaching 2200 feet above the sea, while between these lands and a northwest fingerlike portion projecting into the Scandinavian highland, there spreads a bleak monotonous tundra plain. The maximum elevation in Finland is attained in the extreme northwest where Mt. Halde reaches 4385 feet. The scene is interrupted only here

and there with a primitive habitation—perhaps occupied by a Lapp family, altho the Lapps usually are nomadic—and scattered stands of birch or conifers.

Southern Finland

Southward from central Finland to the sea coast, landscapes show similar characteristics to those in the center except that lakes decrease in number and a remarkable series of sandy eskers forming a type of terminal moraine known locally as the Salpausselka, fringes the major lake district. This series of deposits swings in a broad discontinuous crescent from the southwest coast of Finland in the vicinity of Hanko (Hangö) to the eastern side of the country north of Lake Ladoga. In places it rises 150 feet above the surrounding country and for miles its crest carries the main line railroad between Helsinki and Viipuri (Wiborg) providing at many points the only substantial surface on which tracks can be laid, much of the terrain on either side consisting of unstable peat and bog lands.

The Island Fringe

Bordering the long irregular coast-line of Finland are almost innumerable islands, some merely points of bare rock, projecting above the water surface while others are forested and large enough to support a few habitations. The most extensive, the Åland archipelago off the southwest coast, we have already mentioned. Beautiful as are these island groups in summer, satisfying as they are for sites for summer houses as well as for year round dwellings, and enticing as they may be for the fisherman and the lover of all manner of water sports, and protecting as they are for the mainland against erosion by high waves, and valuable as they may be for military defense, they favor thick ice formation in the early winter and persistent ice late into the spring season, proving a considerable handicap to navigation and hence to commercial communication with the outside world during six or seven months of each year. Ice breakers must be employed at considerable expense to keep steamship lanes open, and even so, in some winters they do not entirely succeed.

The General Drainage System

An airplane view of all of Finland would reveal elongate lakes with axes generally northwest-southeast and a radial arrangement of rivers, with headwaters in the central and east-central regions and courses diverging in northwesterly, westerly, and southerly

directions. Both the lakes and rivers serve as efficient avenues for boat transportation in summer and as smooth frozen highways in winter. They are dotted with pleasure craft, are sought as fishing grounds and in certain localities are harnessed for their power. The unusual arrangement of the rivers with moderate gradients

Fig. 5. The "Manchester" of Finland. The factory district of Tampere (Tammerfors) is located between two lakes at the point where the water from one falls into the water of the second. The smoke-stacks are indicators of the need for supplementing the water power with steam power.

and considerable volume of water favors the floating of timber from the interior to the sea and in consequence, most of the economic activity is concentrated close to or at the coast where the major cities have developed.

Landscapes in the Cities

None of the cities of Finland may be classed in the 500,000 population group. In fact, none contains even half of the number. Yet, on the whole, they resemble the newer cities of the United States more than they do those of most other European countries. Their

patterns are generally of the rectangular type with streets and avenues notably broad. These widths as well as those of alleys present an interesting direct response to the use of wood materials in the construction of many buildings. Since a few cities have suffered heavy fire losses, fire laws have been enacted providing for wide streets and alleys as a check against the possible spread of a conflagration, should any one of the structures begin to burn.

In each city a market place (and in some several market places) occupies a prominent location easily reached by the public, who generously patronize it. Not only are fruits, vegetables, and meats sold in these markets, but also wood utensils, mostly made from birch, brilliantly colored flowers, a great variety of fish, cloth materials in bolts, clothing and second-hand goods of almost every conceivable sort. Certain markets specialize in but one or perhaps two or three classes of goods while other markets display all kinds of commodities. These markets are an especially interesting institution because they present an accurate cross-section of what the rural people produce in the near neighborhood and what the city-folk like to buy. Furthermore, the people who visit the markets include rich and poor alike, persons in all walks of life, offering a colorful pageant of the local trading activities.

In the heart or hub of the cities, as in our town, are located the major public buildings constructed usually from colored crystalline rock materials rather than from brick, for the bed-rock is abundant and relatively cheap. It provides beauty and possesses lasting qualities. Many two-story wood apartment houses are still numbered among the buildings even in the large cities altho wood construction is now discouraged. Newer residential areas utilize brick and stone, the brick walls generally coated with stucco.

So-called straight-line architecture is characteristic of the larger buildings. Architects of Finland have reached the conclusion that in a region of low land and abundant massive rock materials, the most appropriate style calls for straight lines vertically and horizontally, rather than the graceful curves of early Greek forms. Many of the public buildings are severe in form but they harmonize well with the region of which they are a part—one in which the people encounter a severe struggle with nature in order to gain a living.

Many streets are asphalt paved, but some of them are covered with water-worn or glaciated pebbles. This rock material forms a

substantial surface but wooden wheels rattle as they roll over it and pedestrians' shoes must be fortified against it. A walk dividing the street into two parts is bordered by an avenue of trees, or the trees may fringe the curb along which the main sidewalks are located.

Smoke stacks of great factories are notably few in Finnish urban

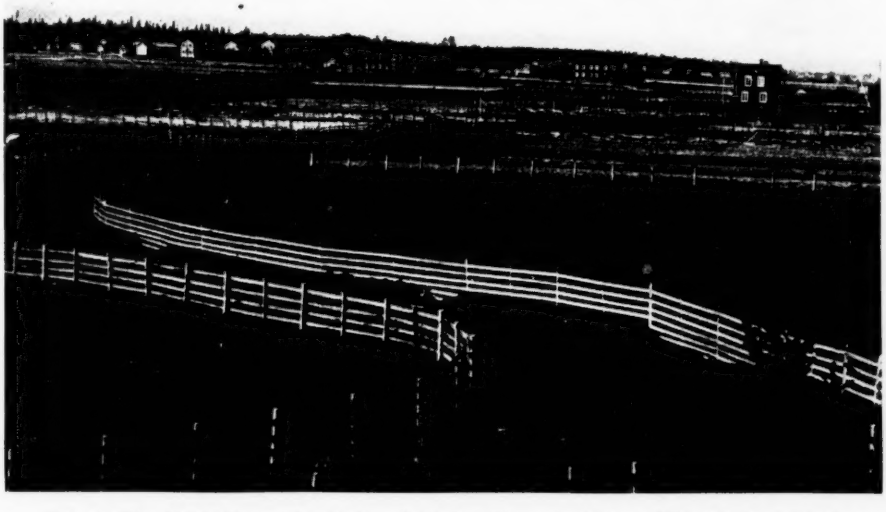

Fig. 6. The Rich Vaasa Agricultural Plain. Characteristic of Finnish farmsteads are well cultivated soils, numerous buildings, usually upon an elevation, and an area of woodland to provide necessary fire wood.

centers. The exception is in Tampere, the Manchester of Finland, where factories established to take advantage of water power developed on the Pyhajärvi drainage system have installed furnaces with tall stacks to supplement hydro-electric power. In other centers where saw mills and paper mills are concentrated as at Enso on the Saimaa and near Kotkamon on the Kymi River more stacks are visible. Even with these tall chimneys there is little black smoke, for while some imported coal is burned, native wood still serves as an economical and clean fuel.

The Sum Total

We have not discussed all of Finland's landscapes, but only a few of those that are characteristic. Furthermore, they are primarily the landscapes of summer. The winter scene which cannot

be presented here in detail offers beauty and inspiration but also reveals another phase of man's struggle to adapt himself to this unique country. Finland is more rural than urban, that is, less of the population lives in cities or in villages than on farms. Practically 80 per cent live in rural districts. Hence, our general impression of the region as a whole is that of a vast agricultural and forested land, interrupted by abundant waterways, with here and there settlements (small in area and population) with urban characteristics.

THE INFLUENCE OF SPECIFIC INSTRUCTION ON MAP INTERPRETATION

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DEVELOPMENT OF GEOGRAPHIC UNDERSTANDINGS

Those interested in geography are constantly endeavoring to find better ways of developing an understanding of relationship between human interests, activities, and experiences on the one hand, and the natural environmental complex on the other. This study points the way to possible improvement in the use of maps in developing such understandings.

STATEMENT OF THE PROBLEM

Geography teachers should constantly endeavor to find better ways to use maps in their teaching because: (1) Maps with equal area yield approximately correct ideas relative to location, shape, extent, direction, and distribution of natural and cultural items.

(2) Maps record a mass of geographic knowledge which would require many pages to record in words and which would be less effectual.

(3) Maps fascinate people who know how to use them.

(4) Pupils build up interpretative ideas, which are steps toward acquisition of geographic understandings of a larger order, by inspecting the cultural and natural items represented on maps.

The problem in this study is to discover what influence specific instruction has in developing interpretative ideas and major geographic understandings thru the study of a set of related maps.

The Procedure Outlined

In attacking the problem, the following procedure was employed by the investigator:

1. A preliminary study of existing investigations was made.
2. A set of eight small maps of each continent, and two groups of pupils—(1) a class of seventh and eighth grade pupils, and (2) a class of eleventh and twelfth grade pupils were selected for the study. Each class was divided into two sections consisting of students of about the same ability.
3. An outline was made for classifying questions the pupils ask relative to the data on the maps. The questions asked before instruction were then compared with those asked after instruction. (It was assumed that instruction would modify the type of questions asked in the degree that questions of relationship exceed in number those of fact.)
4. The investigator planned a series of twenty lessons, each to utilize a daily recitation period of forty minutes. These lessons were modified to conform to the day by day developments in the class.
5. The results were compiled and interpreted after all questions asked by the pupils before and after instruction had been classified.
6. The problem finally was restated giving the contributions of the study as well as its limitations and suggestions for further study.

Assumptions Involved in the Proposed Procedure

1. It is doubtful if teachers give their pupils adequate instruction in map interpretation.
2. Specific instruction should eliminate many of the defects in map study and make it possible for the pupils to interpret the common elements of maps and understand relationships involving two or more maps.
3. Better types of maps and better arrangement are possible in some of the elementary textbooks of geography.
4. Comparative map study is helpful in the development of major geographic understandings.
5. The child's question serves as an index to his ability to discover possible relationships revealed by the maps.

Geographic Materials Basic to this Study

The set of eight small maps of each continent, which is a feature of the Goode School Atlas, was used for this study. These maps are placed on opposite pages, four to a page, so that when the book

is open the entire set of eight is in view. Each set involves a series of fundamental geographical elements, which are: (1) surface temperatures for January; (2) surface temperatures for July; (3) atmospheric pressures and prevailing winds for January, with six months' rainfall; (4) atmospheric pressure and prevailing winds for July, with the other six months' rainfall; (5) annual rainfall; (6) native vegetation; (7) land relief; and (8) population density.

From this set of related maps the pupil is expected to learn lessons in cause and effect; for example, from high altitudes and scant rainfall to steppe and desert vegetation and a sparse population; or, as in the Siberian Plains, low temperatures and scant rainfall, to forest or alpine and tundra vegetation and sparse population.

Securing and Classifying Questions

The investigator divided the group of eighteen seventh and eighth grade pupils and the group of twenty-eight eleventh and twelfth grade students into two sections of approximately equal knowledge and ability in order that the rotation method of experimentation could be used in the research. The pupils in Group I Section 1 were given the atlases with a request to "Please study the eight related maps on Africa and write ten questions about the maps, the answers to which you would like to know." They were permitted to use as much time of the class period as they needed in which to prepare the questions, but only a few used the entire period. The next day the pupils in Section 2 of the same group were given the atlases with a request to "Please study the eight related maps on *Australia* and write ten questions about the maps, the answers to which you would like to know." In a like manner questions on *North America* were secured from Group II, Section 1 and questions on *South America* from Group II Section 2. After instruction was given on *Asia* to both groups, the sections of each group were rotated. Group I Section 1 was then asked to write questions on *Australia,* Group I Section 2 on *Africa,* Group II Section 1 on *South America,* and Group II Section 2 on *North America.* By rotating the groups and having them ask questions about corresponding maps of different continents both before and after instruction it was possible to find out whether pupils think in terms of facts or in terms of relationships when they study any set of related maps. The questions asked by the pupils were copied on a convenient form for classification exactly as they had been written by the pupils.

The Planning and Modifying of Lessons

Twenty lessons of instruction were outlined by the investigator. A general outline was first prepared containing in brief what was thought should be contained in such a specific course of map instruction. Each morning before the instruction period, which came the afternoon of the same day, the lesson for that day was outlined in detail and the lesson of the day before modified. Anyone who may care to use the lessons for classroom instruction can expect to obtain comparable results.

In order to acquaint the reader with the type of lessons planned, Lesson Four is here given in detail:

Lesson Four

A. Purpose

I. To check to see which elements of the natural environment the pupils are familiar with before they study the maps.

II. To suggest other elements that might be omitted.

B. Method

I. The pupils were asked to give reasons why certain parts of Asia are so densely populated and why other parts are so thinly populated.

II. The following reasons were given by the pupils to show why most of the people live in South and East Asia.

1. There is more rainfall there.
2. People want to live there.
3. The countries are nearer the ocean, so it is warmer there.
4. There are more rivers there.
5. It is warmer.
6. Better crops can be raised.
7. The soil is better.
8. The countries have better sea ports.
9. There are not so many wild animals there.
10. Siberia is too cold to live in.

III. The suggestions would indicate that the pupils were thinking of the following elements: (a) rainfall; (b) temperature; (c) vegetation; (d) soil; (e) location in reference to oceans; (f) native animals.

IV. The pupils failed to take relief into account so this item was suggested by the investigator.

Understandings Developed by Lesson Four

1. People usually choose to live where the elements of the natural environment contribute to their interests and welfare.

2. A large proportion of the population of Asia lives in river valleys because of natural advantages offered for (1) travel and transportation, (2) water power, (3) water for irrigation, (4) water for domestic purposes, (5) water for animals, (6) alluvial soils for crop production, (7) food materials, (8) recreation, (9) the

location of town and cities, and (10) the disposal of waste materials in connection with human occupancy.

Technique of Instruction

The atlases were passed out at the beginning of each period and taken up at the close. The children studied them during the instruction period only. They were always eager to turn to the set of maps on Asia for they knew that they would discover many new situations that called for interpretations.

After a few periods had been spent in discussing (1) the function of geography; (2) the introduction of the series of maps on the continents; (3) the correct meaning of symbols, key, etc.; (4) the criteria of good maps; and (5) the elements of the natural and cultural environment, the remaining lessons were devoted to the purpose of bringing out interpretations which lead up to developing geographic understandings.

Pupils were usually asked to compare the maps so as to be able to explain the "why" of phenomena shown. Lessons five and six dealt with the vegetation and population maps. The pupils were asked to study the population and vegetation maps to see if explanations could be found which would help explain why people chose to live where they do. Usually a discussion would follow during which the children were urged to ask questions of their classmates. At first these questions were mainly factual, but when the children became familiar with the symbols, key, etc. they soon realized that it was the relationship questions that were really important.

Results of Question Classification

The results of the classification of the pupils' questions before and after instruction are very illuminating. Before any instruction was given 61.6 per cent of the questions asked by the seventh and eighth grade pupils were factual and 38.4 per cent involved relationships. After twenty forty-minute periods of instruction 19.5 per cent of the questions asked by the same group were factual while 80.5 per cent involved relationships. Before instruction 15 per cent of the questions implicated two or more maps as compared with 72 per cent after instruction. Before instruction was given 76 per cent of the questions asked by the eleventh and twelfth grade pupils were factual and 24 per cent involved relationships. After receiving the same instruction as the grade pupils 11.5 per cent

of the questions asked were factual while 88.5 per cent involved relationships. Before instruction 13.5 per cent of the questions implicated two or more maps as compared with 75.3 per cent after instruction.

TABLE SHOWING RESULTS OF QUESTION CLASSIFICATION

	7th and 8th Grades		*11th and 12th Grades*	
	Before Instruction	*After Instruction*	*Before Instruction*	*After Instruction*
Factual	61.6%	19.5%	76 %	11.5%
Relationship	38.4%	80.5%	24 %	88.5%
Involving 2 or more Maps	15 %	72 %	13.5%	75.3%

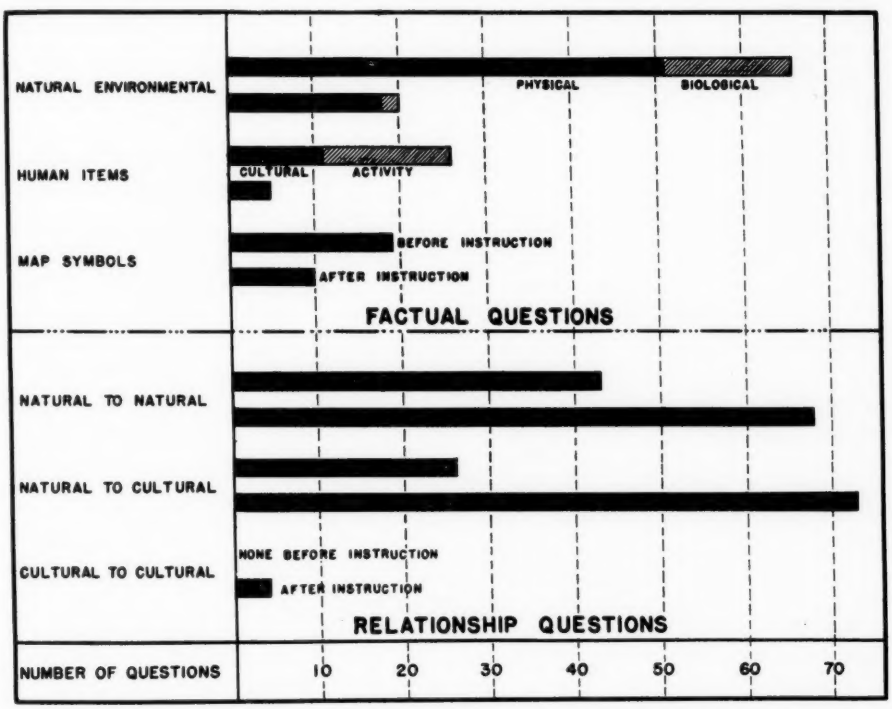

Fig. 1. A graf showing the number and kinds of factual and relationship questions asked by all students of Group I (Grade) before and after instruction. The upper horizontal bars represent questions asked before instruction and the lower bars questions asked after instruction. The graf is read thus: Before instruction out of the one hundred eleven questions asked sixty-six were concerned with the natural environmental, fifty-one being classified as physical environmental and fifteen as biological environmental. After instruction, out of the thirty-five factual questions asked, twenty were concerned with the natural environmental, nineteen being classified as physical environmental and one as biological environmental. Note the decrease in the number of factual questions and the increase in the number of relationship questions after instruction.

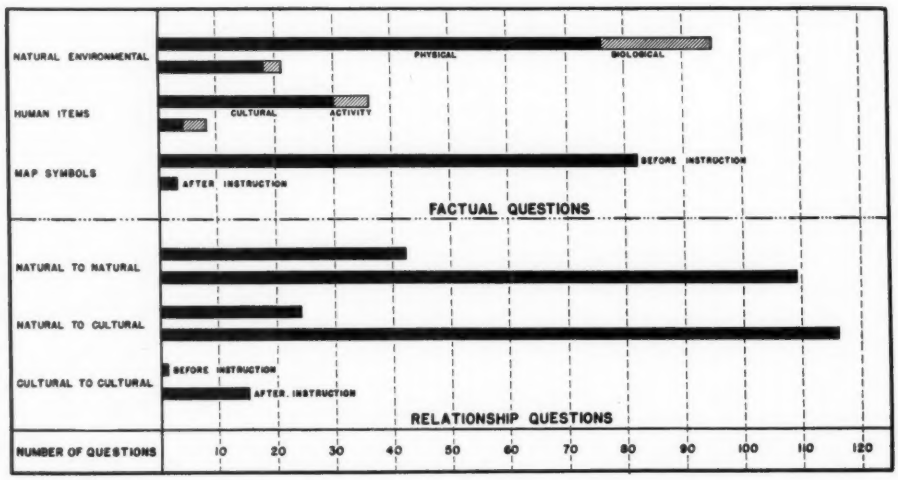

Fig. 2. A graf showing the number and kind of factual and relationship questions asked by all students of Group II (High School) before and after instruction. The upper horizontal bars represent questions asked before instruction and the lower bars questions asked after instruction. The graf is read thus: Before instruction, out of the two hundred thirteen factual questions asked, ninety-five were concerned with the natural environmental, seventy-six being classified as physical environmental and nineteen as biological environmental. After instruction, out of the thirty-two factual questions asked, twenty-one were concerned with the natural environmental, seventeen being classified as physical environmental and three as biological environmental. Note the decrease in the number of factual questions and the increase in the number of relationship questions after instruction.

The grafs reveal the number and kinds of factual and relationship questions asked by the seventh and eighth grade pupils as well as the eleventh and twelfth grade pupils before and after instruction.

The grafs show clearly that after instruction was given the majority of the questions involved relationships of natural items to cultural items. This seems remarkable when five of the six related maps studied were concerned mainly with items of the natural environment. It shows how interested children may become in relating man's activities to his natural environment when specific map instruction is given.

CONCLUSIONS

This study contributes to the fields of geography in several ways:

1. It uses materials, namely the set of eight small related maps of each continent, which are available to even the smallest school,

and suggests a series of lessons on map interpretation that lead to an understanding of concepts of geography of a larger order.

2. It shows that without definite instruction in map interpretation, the average pupil thinks chiefly in terms of geographic facts when he studies a map or a set of related maps. After the pupil is taught to interpret the maps on the basis of relationships, he learns to relate various factors in the map to one another.

3. Only two students out of forty-six failed to see greater possibilities in map interpretation. This fact would indicate that specific instruction in map interpretation is very much worth while.

4. It indicates that maps should have a prominent place in the textbook of geography. The maps should be accompanied by special suggestions for study as many teachers do not understand maps and they fail to see their great teaching value in developing concepts of relationship.

5. It uses the pupil's questions as an index to his ability to interpret and to discover possible relationships when studying a set of related maps. The study suggests the use of the pupil's questions in checking the results of an experiment in many fields where objective tests are not suitable or available.

6. Above everything else, this study shows the influence of specific instruction on the ability of children to interpret maps and understand relationships involving two or more maps. It demonstrates how instruction of this kind can give the pupil a clearer conception of the particular contribution that geography makes to his training.

THE SPONGE INDUSTRY AT TARPON SPRINGS, FLORIDA

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Sponges, as a commodity of trade, became known long before the Christian Era. The Bible and ancient writings of Greece frequently refer to them. With no really efficient substitute the demand for sponges thruout the ages has fully equalled production. Today new industrial uses, constantly discovered, obviate any likelihood of a surplus. The original name in Greek, *zoofiton,* means half plant and half animal from doubt as to which classification sponges really belong.

Tarpon Springs, near the mouth of the Anclote River, in Pinellas County, claims the largest sponge market in the world. Tarpon Springs, Key West, and Perry divide the catch taken from the waters of the Florida coast of which 80 per cent goes to Tarpon Springs.[1] Several factors account for this situation.

THE GROUNDS

Three separate elongated areas along the southern and western coasts comprise the sponging grounds: (1) Nearly all of the Florida Reefs from Biscayne Bay to just west of Key West. In their extent of 120 miles the grounds widen from about 5 miles in the northeast to about 15 miles in the southwest. The water varies in depth from 18 to 40 feet. (2) Some 50 geographical miles from near Anclote Keys to just south of Cedar Keys. The width of the grounds varies as you proceed northward from 7 to 15 miles. Altho 4 to 5 miles from the mainland, the depth of the water ranges from 18 to 40 feet. (3) From near Cedar Keys to St. Marks in Appalachee Bay. Thruout its length of 70 miles, this field has a uniform width of 15 miles, and it approaches, in places, to within 5 miles of the shore and a difference in water depth from 18 to 30 feet.[2]

Spongers estimate 9,300 sq. mi. of sponge-yielding bottom between St. Johns and St. Marks, altho only about a third of the area has been, or is being, worked. They discover new grounds constantly; old grounds remain unworked until new sponges develop to merchantable size. Because of the rapidity of their growth, this

[1] U. S. Tariff Commission. Sponges. 1932. Report No. 51, Second Series.

[2] J. H. Matthews, Fisheries of the South Atlantic and Gulf States. *Economic Geography,* Vol. 4, No. 4, pp. 323-348.

requires only a few months. Central location, among the fishing grounds, enhances the importance of Tarpon Springs as a center for the sponge industry.[3]

Methods of the Fishery

At Tarpon Springs fishermen use two methods in gathering the catch, diving and hooking. Offshore fishing, in deeper water, requires the diving method. The "hookers" work inshore, generally in shallower water less than 20 feet in depth.

Fig. 1. Map of Florida showing the position of Tarpon Springs among the sponging grounds.

Hooking sponges is the simpler and more primitive of the two methods. Two-mast schooners, 40-50 feet in length, tow a string of dingeys to the fishing grounds. The hooker works from the dingey, sometimes alone, and oftentimes with a partner. When working with a partner, one poles the boat to the place indicated by the man in the bow. He locates the sponge on the bottom, if clear, unaided; or if the surface becomes disturbed by wave action, he peers thru the sponge glass, a common wooden bucket fitted with a glass bottom. When quite rough, he smooths the surface with olive oil, as spongers do on the Mediterranean grounds; or, still better, with oil extracted from livers of nurse sharks. This forms a tenacious film and spreads over a wide area of water. Sprinkled on by means of a large-neck bottle, the oil is spread by means of a stick or swab.[4] In this case the sponger follows the "slick" by poling back and forth. The sponger uses his hook—a sharp three-

[3] Field notes by the author.

[4] H. F. Moore, A Practical Method of Sponge Culture. Bulletin of Bureau of Fisheries, Vol. 28, 1908, Part I, pp. 545-586.

toothed small rake-like tool fastened on the end of a long light pole—tears the sponge from its bed and lifts it almost perpendicularly from the bottom. When he has made his catch, he returns to the schooner, which serves as his home at sea, and begins to clean the sponges. A hooker usually stays out for only short periods of time. He encounters three major difficulties. First, cloudy water from swamps deposited by streams along adjacent shores obstruct his view. Second, milky water resulting from roiling the sand and calcareous marls of the bottom precludes clear vision. And third, strong currents which bend the long slender poles often force the hook away from the sponge and prohibit quick hooking. Oftentimes the hooks become so displaced that a second and third atttempt is necessary.[5]

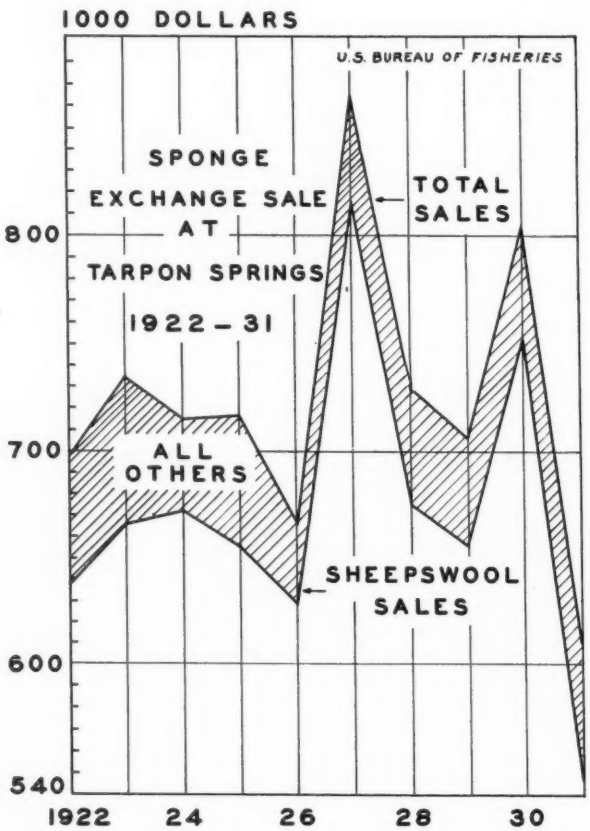

Fig. 2. Graf showing the sale of sponges at the Tarpon Springs Sponge Exchange from 1922-1931. Shading shows the importance of sales of all other varieties than sheepswool.

The diving method begun in 1905 on Anclote Key by John Cocoris, a Greek, developed (with the financial help of John Disston of hand-saw fame, J. K. Cheyney, a resident of Tarpon Springs, and others) so that today it outranks the hooker method both in quantity and quality of the catch. Available capital for developing fleets and the proof that sponges could be gathered by diving attracted other Greek divers, making Tarpon Springs the chief center

[5] Field notes by the author.

for this method. A sponge diver's outfit consists of a two-mast schooner, between 10 and 20 tons of deep draft and one or more machine boats. Living quarters for the crew and a hold for the sponges are provided on the schooner. The machine boats, Greek type double-enders, with high bows and sterns, carry the diving equipment. These ships have a crew varying from four to six men,

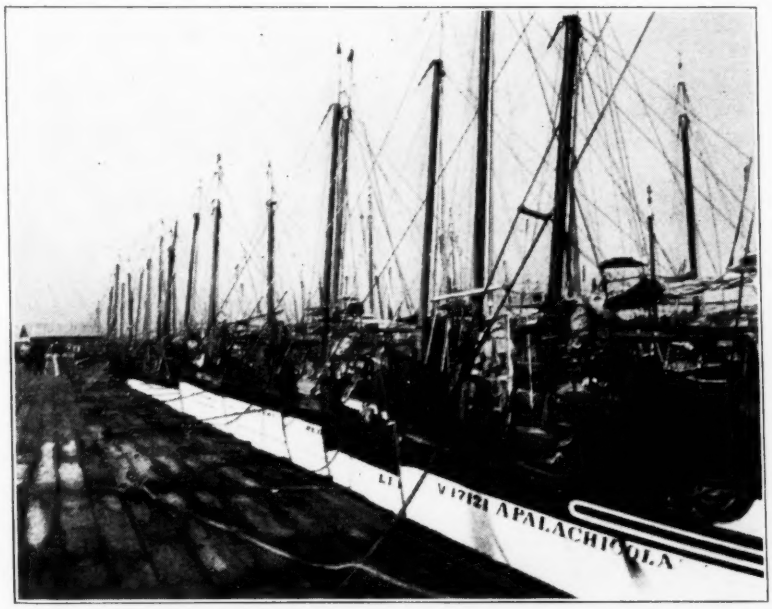

Fig. 3. Fleet's in! A portion of the sponge fleet used in the diving method. Masts, looking like the remaining trees of a dense burned-over forest, resemble on a smaller scale, the fishing schooners at Gloucester, Mass.

exclusive of the two divers. All are Greeks, many from the islands of Greece, especially those which have come under the control of Italy. The sounding lead assists in locating the right bottom for sponging. The diver descends, works in shallower depths for several hours, but in deeper water for much shorter periods. A stay of forty-two minutes at 201 feet has been recorded.[6]

All diving consists of the soft suit variety. The diver dresses in a thick rubberized suit with bronze shoulder piece onto which fastens the helmet. Air, forced by an ordinary air pump, passes thru a long rubber hose protected with heavy cloth. When fully dressed with suit, helmet, weighted shoes and neck weights, he carries a burden of 200 pounds. In naked diving, used earlier in the history of sponging, sharks constituted the greatest peril. In ma-

[6] Field notes by the author.

chine diving, it is the fouling of the life line. Much care is taken to prevent this; even wire cages, placed around the propellers of the engines, help to lessen the danger. The diver communicates with the life line tender on the deck by a series of jerks on the life line. Casualties do not run high; however, the life of the diver may be shortened ten or more years. Lucky is he who in old age, after a

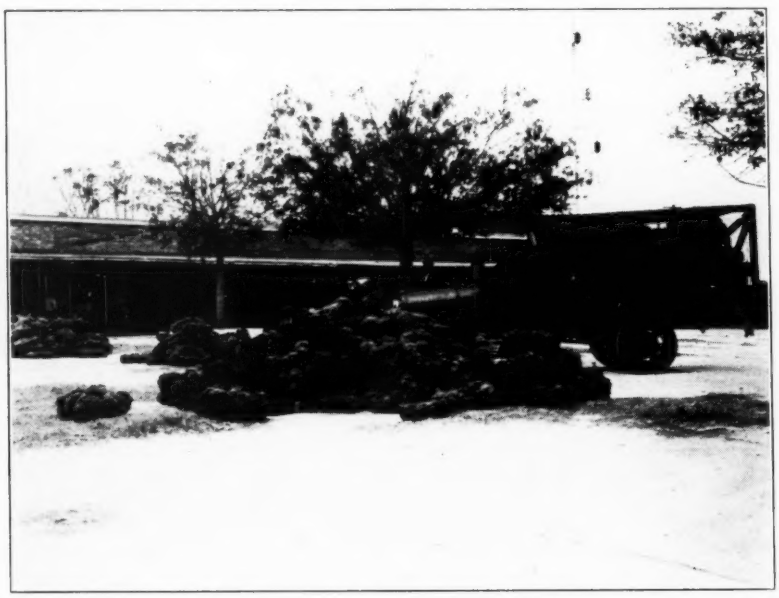

Fig. 4. Packers remove their sponges from the sponge exchange by means of trucks. Several stalls can be seen around the edge of the court. At the right, above the truck, may be seen the Weather Bureau tower from which flags fly by day and lights shine at night to warn the captains of the sponge fleet of approaching storms.

life as a diver, finds that the water pressure has not caused paralysis or what is commonly known among spongers as "the bends"![7]

Production by the diving method amounts to 60 per cent of the total value of all sponges gathered. The average income of the diving boat approaches $20,000 a year, while that of the hooker totals much less. The crew uses the share basis in receiving its pay. From the selling price is deducted the costs of operation, interest, insurance, repairs, and fuel. After the profit is determined, it is allocated as follows: boats 5 shares, engineer 2 shares, life-line tender 1½ shares, cook 1½ shares, and deckhands 1½ shares each.[8]

[7] Field notes by the author.

[8] U. S. Tariff Commission. Sponges, 1932. Report No. 51, Second Series.

Preparation for Market

The first process in preparation for market begins at sea. As the bags with sponges come on board, pounding with short clubs or treading with bare feet eliminates the gray gelatinous pulp or animal matter, known as "gurry." They are then strung on twine, hung in the sun and during the night thrown overboard so that the action of the water may complete the disintegration process. The

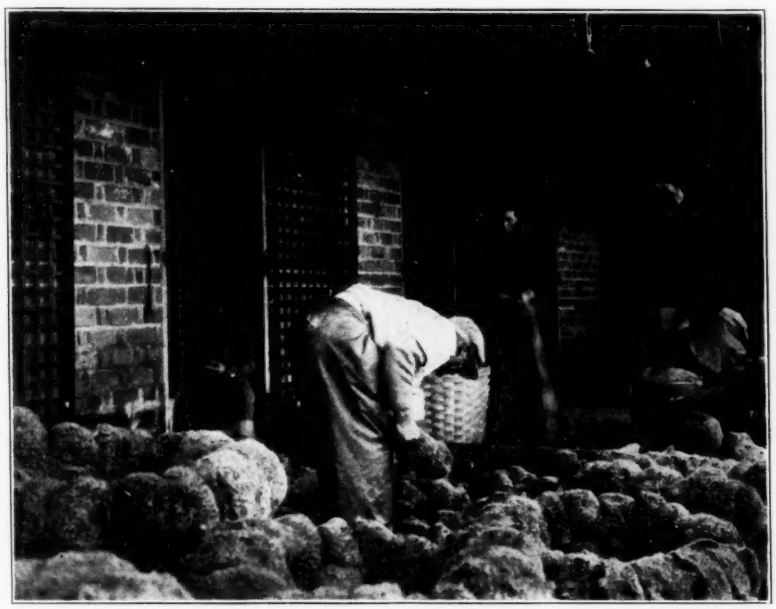

Fig. 5. Iron grating doors permit air to circulate within the sponge stall. The man in the doorway sorts the sponges as to quality and variety while the man standing strings them on strong cord forming the wreath seen in the foreground. Soon these will be sold to packers on the sponge market.

next morning workmen remove the outer skin with a knife and again hang the sponges between the masts to complete the curing. Square or circular pens, called "crawls," made by driving small poles in shallow water, supplement the curing process. In these crawls, used exclusively by hookers, tidal action of the salt water hastens decay. After the animal matter has been removed, the skeleton left represents the sponge as we know it, only dark grey in color. Bleaching in a solution of permanganate of potash to obtain commercial color, takes place at the packing house or even in New York.

Upon arrival at the docks the captain sorts the sponges for quality and size and places them in an assigned stall of the Sponge Exchange. Before auctions occur, workmen thread them on a strong cord and tie them in wreaths. The number in a wreath varies from ten to twelve according to size.

On Tuesdays and Fridays each week thruout the year occurs the sponge market. The buyers assemble and after learning the quality of a pile of wreaths, each writes his offer on a slip of paper. This he hands to the representative of the Exchange. After the bids are in, the representative announces the highest bidder. Unlike other auctions, the seller may refuse to sell if he considers the bid too low, and can hold over for another sale.[9]

Packers remove their sponges from the floor of the open exchange to the packing houses by means of trucks, where they undergo further preparation. Here they cut the wreaths, break off all pieces of shell or rock, trim them using sheep shears to remove any roughness, then dry them in the sun. When dry sponges are packed in bales weighing from forty to sixty pounds. The bales are numbered, invoiced, and shipped to their destination from which they are afterward distributed among the retail houses.

New York receives the larger part of the Tarpon Springs catch. All imports reach New York by boat or express. The better grades go by express at the rate of $4.70 a 100 pounds. Others reach New York by boat from Tampa at the rate of $1.73 a 100 pounds. From Tarpon Springs to Tampa auto-trucks carry them at the rate of 50 cents a 100 pounds. In 1931 New York alone received about half of the domestic production, but 76 per cent of the imported production. Other important markets include Chicago, St. Louis, and Cincinnati. Transportation facilities and favorable rates, both by rail and water, to the various sponge markets, serve as an important factor in locating the industry at Tarpon Springs.[10]

VARIETIES OF SPONGES

Spongers classify their catch under four main varieties in order of quality: (1) sheepswool, (2) yellow, (3) grass, and (4) wire. Buyers consider size, shape, softness, firmness, durability, resiliency, absorptiveness and color.

Sponges are used mainly for two kinds of work: (1) automobile

[9] Field notes by the author.

[10] U. S. Tariff Commission. Sponges. 1932. Report No. 51, Second Series.

washing and (2) other cleaning purposes. Sponge jobbers refer to the two classes of consumers as the "auto-washing trade" and the "paint trade," because most of the sponges are bought by painters. Auto-washing trade uses only the sheepswool variety and confines its purchases almost entirely to the more durable grades. As such grades come only from relatively deep water, and as fishing in deep water is done by United States vessels, practically the whole supply of auto-washing sponges originates from domestic waters.[11]

Paint trade divides its purchases into two groups: (1) less durable sheepswool and (2) yellow, grass, and wire of all grades. Consumers offer decided resistance to changing varieties, so disposal of varieties varies little. Paint trade varieties are obtained by shallow water diving and hooking.

Fig. 6. The diver ready to descend. Note the hook, the rope bag for carrying the sponges, suit and the weights. Behind him stands the life-line tender with the life-line, the only means of communication the diver has when below water surface.

The Sponge Trade

The United States exports and imports sponges. When weather conditions have precluded an average catch off our own shores, our imports increase. They arrive chiefly from two areas, Batabano,

[11] J. H. Matthews, Fisheries of the South Atlantic and Gulf States, *Economic Geography*, Vol. 4, No. 4, pp. 323-348.

Cuba, and Nassau in the Bahamas. Excessive fishing on the Cuban beds and the presence of hurricanes on the Bahama beds may also cause decline of imports. Our annual average imports, however, from 1923-1931 amounted to $920,000, while in 1931 alone value amounted to only $665,000.[12]

Exports, fairly uniform over a nine year period (1922-1930), averaged $152,000 of which Argentina took 23 per cent, United Kingdom 16 per cent, and Canada 19 per cent. Most of the remaining 42 per cent were shipped to Northern Europe—chiefly Belgium, Denmark, the Netherlands, France, and Germany. Exports consist chiefly of smaller sponges suitable for the bath and for general cleaning purposes. Demand in European markets was almost equally divided in quality between lower grades of sheepswool and better grades of yellow and grass varieties. In value sheepswool represents 75 per cent of the total.[13]

In 1849 when the sponge industry became of commercial importance at Key West, Fla., the first and sole center, the value of the sales amounted to $10,000. In 1931, because of the increases in the automobile industry and other uses found for sponges, the value of the sales amounted to almost a million dollars; and Tarpon Springs, with about $800,000 of that value, leads all of the rest.

[12] U. S. Tariff Commission. Sponges. 1932. Report No. 51, Second Series.
[13] Ibid.

SOME EXERCISES IN GEOGRAPHY STUDY TECHNIQUES FOR COLLEGE FRESHMEN

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The accompanying chart in Fig. 1 represents an effort to analyze the skills essential to the study of geography at the college level. This analysis grew out of the recognition that the majority of college freshmen lack the essential abilities and study habits requisite to the effective use of geographic materials. For most students, poor study techniques are due mainly to the lack of geographic study between the early junior high school and the freshman year in college and to the inadequate training in these skills in the grade school. In order to develop accurate geographic thinking at the college level it was found necessary to include in the freshman geography manual exercises designed to establish or re-establish the study skills necessary in the use of geographic materials. These exercises were planned to develop in the student the ability to secure geographic data independently.

Since lack of space prevents giving study directions for entire units of work, the following examples, selected at random from the manual, illustrate some ways in which students are guided in developing the skills outlined in Fig. 1.

I. Introductory study directions

This exercise is designed to develop skill in securing geographic information from several types of materials which are, perhaps, new to you and which you need in studying geography effectively. Maps, globes, pictures, statistics, grafs, and readings are the principal sources of information. The various abilities and skills, most of which you are expected to master by the end of the third regional unit, are summarized in the accomanying chart. Thruout these early units reference will be made to the Skills Chart whenever practice is given in a specific skill or ability. Numbers in parentheses refer to the numbered abilities in the chart. If you follow the directions below exactly as outlined, answering each question and filling in each blank *before going on to the next,* in this and following exercises, you should acquire the skills outlined in the chart. (Skills Chart 2). What is the name of the work region which you are to study in this unit? ..... Find this region on the "Work Regions Map of North America." Color it dark blue, as shown in the legend of the copy posted in the laboratory. *Always* keep

this map open on the table before you as you study in order to place types of work accurately. (Skills Chart 2, 7, 12, 13b).

Find the political divisions in this work region by comparing

CHART OF SKILLS ESSENTIAL TO SECURING AND UNDERSTANDING GEOGRAPHIC INFORMATION FROM MAPS, ATLASES, GLOBES, GRAFS, STATISTICS, PICTURES, AND READINGS

BASED ON THE FOLLOWING ABILITIES:

GENERAL ABILITIES:

1. *To think accurately*
2. *To follow directions*
3. *To use the dictionary*
4. *To use the index and table of contents*
5. *To select facts pertaining to a given topic or region*
6. *To translate word or other symbols into concrete imagery*
7. *To recognize cultural facts, features, and conditions*
8. *To recognize natural facts, features, and conditions*
9. *To recognize geographic relationships*
10. *To recognize significant geographic problems*

SPECIAL ABILITIES:

11. *To recognize the importance of a title or caption*
12. *To recognize the importance of a legend*
13. *To read and to understand information given in legend*
    a. *Range as indicated by color or other symbol*
    b. *Meaning or value of symbol*
    c. *That size of symbol may not represent land area covered*
14. *To use and to recognize significance of latitude and longitude*
    a. *To read latitude or longitude of a given place or area*
    b. *To locate place when given latitude or longitude*
    c. *To recognize relation between latitude and temperature: low, middle, and high latitudes*
    d. *To read north-south and east-west directions*
15. *To use a scale of miles*
16. *To compare data from two or more sources when materials have*
    a. *The same or different scale*
    b. *Symbols of the same or different value*

Fig. 1

maps in Goode's School Atlas, pages 52-53 and 54-55, with your "Work Regions Map." Political boundaries are shown in the atlas in heavy red lines. The latitude and longitude of each political division may be found in the index of the atlas, pages 177-286. (Skills Chart 2, 4, 5, 7, 8, 14a, 16a)

II. Some major problems to be worked out as you study

A. Population: Consult your "Population Map of North America" and color for this region only. The population density of this region may be characterized as .....
This map should suggest to you two problems concerning:
1. Density of population .....
2. Distribution of population .....
(Skills Chart 1, 2, 5, 7, 10, 12, 13b)

B. Standard of living: By consulting the pictures in Group A (posted in the laboratory), you will find that the standard of living in this region might be characterized as ..... to ..... (low, fair, medium, high, very high). This fact suggests the following problem: .... (Skills Chart 2, 7, 10).

III. Kinds of Work

A. Field work with pictures:—The most effective way to study man's adjustments to the natural environment in any region would be to travel thru the region observing the ways in which man is using the natural resources. In common practice the term "natural resources" is used often to designate only the mineral resources of a region. From a geographic point of view *any natural factor might constitute a natural resource.* A careful observer will see not only kinds and degrees of development but also signs indicating whether or not wise and profitable adjustments have been made. Since we are unable to make first hand observations in various parts of the world, we must do our "field work" in the laboratory with pictured landscapes. Much practice is needed to acquire skill in effective reading of real or pictured landscapes. During the next class hour the instructor will conduct a laboratory "field trip" in this work region.

B. Picture study:— (With the above classroom "field trip" experience as a basis, the students are directed to work out the following picture study for the second work region).
Nine groups of pictures and maps have been assembled to show the nine chief activities carried on in this region. These materials are posted in the laboratory. First make a rapid survey of the pictures in order to gain a general idea of the principal ways of earning a living. For each group of pictures make more detailed observations, organizing your work as in the previous unit and making note of:

1. The actual geographic relationships pictured, that is, when both the activity and the natural factor or factors to which man's work is related are shown.
2. Suggested geographic relationships, that is, activities shown in natural settings which only suggest the natural factors to which the work is related. These suggested relationships may be written as actual adjustments to the environments but must be verified later thru readings or other materials.
3. Geographic problems, which are raised by pictured activities with no apparent or suggested natural reasons in the landscape.
4. Natural environmental features or conditions which might be used later in helping to solve some of the problems raised. (Skills Chart 1, 2, 5, 7, 8, 9, 10, 11)

IV. Map and graf study

A. According to the "Climatic Regions Map of North America" this region has four types of climate: .....; .....; .....; and ...... Color these types for this region. Do not color other areas.

B. Color and consult the January and July temperature maps. Average January temperatures over the whole region are ..... degrees F. and are described as ...... Average July temperatures over most of the region are ..... to ..... degrees F. A few small areas along the northern border have July temperatures of ..... to ..... degrees F. The summer for most of the region then, would be characterized as ....., with only a few small areas on the northern border that are .....

C. Consult the climatic grafs for Fort Chipewyan, Alberta and Port Arthur, Ontario (posted in the laboratory). Locate each weather station on your "Climatic Regions Map" by means of a dot and the name. Fort Chipewyan, which is in the ..... type of climate has a growing season of ..... months. Port Arthur which is in the .... type of climate has a ..... months growing season. Fort Chipewyan has a total annual precipitation of ..... inches while Port Arthur records .... inches. At both places the maximum precipitation comes during the ..... season.

D. Color the "Average Annual Rainfall Map" for this work region only. The annual precipitation may be characterized as ..... to ..... with an increase in precipitation from the ..... part to the ..... part of the region.

E. By comparing the climatic grafs of Fort Chipewyan and Port Arthur, representing the ..... and ..... types of climate, with those of Point Barrow and the North Polar Region, representing the ..... and ..... types of climate you find that coming south from the North Pole, winters become ....., summers become ....., and the growing season becomes ..... (Skills Chart 1, 2, 5, 8, 11, 12, 13a, 13b, 14b, 14c)

V. Statistics

The statistics show that British Columbia ranks ..... in ..... (fisheries) of Canada with a total production value of approximately ..... or about ..... per cent of the Canadian total. According to the statistics, British Columbia ranks ..... among Canadian regions in ..... (mineral) production and produces about ..... of the total. (Skills Chart 1, 2, 5, 7, 11)

VI. Readings and summary directions

A. Complete your study of this region by reading the references given below. As you read, look for additional natural reasons to help solve the problems raised above and add new relationships to your list. Reading should also aid you in visualizing the region you are studying. (Skills Chart 1, 2, 5, 6, 7, 8, 9, 10)

B. Constant use of the Work Regions map, the atlas, and other maps while you read will enable you to place cultural and natural items accurately and to omit irrelevant material. The dictionary and an atlas are absolutely necessary aids to study. (Skills Chart 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

Upon the completion of each of the first three regional units, one of the following tests was given to measure progress in the acquisition of study techniques. The first of these tests, based on the use of maps, atlases, and climatic grafs, was designed to check items 2, 3, 7, 8, 11, 12, 13a, 13b, 14a, 14b, 14c, 14d, 15 in the Skills Chart (Fig. 1); the second, based on the use of maps, atlases, climatic grafs, and pictures, to check items 4, 5, 9, 10, 16a and to recheck items 2, 7, 8, 11,

12, 13a, 13b, 14a, 14b, 15; the third, based on the use of maps, atlases, grafs, pictures, statistics, and readings to check items 6 and 16b and to recheck items 5, 7, 8, 9, 10, 11, 12, 13b in the Skills Chart.

First Skills Test

Materials for this exercise: Goode's School Atlas; all of your maps of North America; the map (numbered I) and the climatic graf given you with this exercise.

I. Terminology

Place in the parentheses before each definition the number of the word it defines.

1. Natural Resources	( ) key explaining map symbols
2. Longitude	( ) an area under one governmental control
3. Scale of Miles	( ) number of days without killing frost
4. Legend	( ) distance north or south of the equator
5. Marine Climate	( ) averages of weather records for temperature, precipitation, rainfall, cloudiness, and winds
6. Density of Population	( ) height of land above sea level
7. Climatic Data	( ) a graduated measure for computing distances on maps
8. Political Region	( ) distance east or west of the prime meridian
9. Average Annual Precipitation	( ) number of people per square mile
10. Five Sources of Geographic Information	( ) yearly mean of rain and snowfall
11. Latitude	
12. Growing Season	
13. Distribution of Population	
14. Work Region	
15. Elevation	

II. Reading Maps

A. Find on the outline map (Map I) given you with this exercise the area marked off in orange and designated as A. From this map secure the following information for area A:

1. The latitude is ..... to .....
2. The longitude is ..... to .....
3. The north-south extent is about ..... miles.
4. These facts are ..... (cultural or natural).

B. Open Goode's School Atlas to the map on page 98. The name

of the country on this map at 2° S. to 12° N. latitude and 66° W. to 79° W. longitude is .....

C. Put before you Map I and the Work Regions map of North America. Outline area A lightly on your Work Regions map. Using this map as a guide, find from your set of maps the following information for area A:

1. Work regions are .....
2. Poplation densities are .....
3. Facts contained in 1 and 2 above are ..... (cultural or natural).
4. The types of climate are .....
5. The average annual precipitation ranges from ..... inches to ..... inches and may be characterized as from ..... to .....
6. The types of natural vegetation are .....
7. The elevations of the land are .....

D. Open Goode's School Atlas to the Temperature maps on page 50.

1. January temperatures are ..... degrees F. and may be characterized as .....

III. Reading Grafs

A. Secure from the climatic graf attached to Map I (given you with this exercise) the following information:

1. Summer (June, July, August) temperatures are from ..... degrees F. to ..... degrees F. and may be characterized as .....
2. Autumn (Sept., Oct., Nov.) temperatures are from ..... degrees F. to ..... degrees F. and may be characterized as ..... to .....
3. Winter (Dec., Jan., Feb.) temperatures are from ..... degrees F. to ..... degrees F. and may be characterized as .....
4. Spring (March, April, May) temperatures are from ..... degrees F. to ..... degrees F. and may be characterized as ..... to .....
5. The growing season (obtained by counting the number of months with temperatures above 50° F. and subtracting 1) is about ..... months long.
6. The average annual precipitation of ..... inches comes

chiefly in the months of .....
.....

7. The temperatures of this station indicate that it is in the ..... latitudes (low, middle, high).

SECOND SKILLS TEST

1. In Goode's Atlas, the world economic map showing the value of output of diamonds by countries is found on page .....
2. The town of Samarai, in the country of .....
..... is situated at latitude ..... and at longitude ..... and can be found on page ..... of Goode's Atlas.
3. Place K on the outline map of Africa is located at ..... latitude, and ..... longitude, and is in the country (or political division) of ..... The longitude of place M, in the country (or political division) of ..... is ..... and the latitude is ..... It is approximately ..... miles between the two places, K and M.
4. The city at 28½° S. latitude and 24½° E. longitude is .....
5. Using the maps on pages 136 and 137 of Goode's Atlas, secure the following information for place R:
   a. July normal surface temperatures are .....
   .....
   b. Annual rainfall is .....
   c. Vegetation is characterized as .....
   .....
   d. Relief is shown as .....
   e. Density of population is .....
6. Secure the following information from the climatic graf:
   a. The January, or winter, temperature is ....., which is characterized as .....
   b. The July, or summer temperature, is ....., which is characterized as .....
   c. The length of the growing season is .....
   .....
   d. The average annual rainfall is ....., with a maximum in the .....
7. The geographic relationship shown in picture 1 is .....

.....

8. The geographic problem raised by picture 2 is .....

.....

THIRD SKILLS TEST

1. Write two geographic relationships from the following paragraph:

   The value of the iron ore deposits of the Mesabi, Minnesota, district is greatly increased because of the ease with which they can be exploited. They are rich in iron, lie relatively near the surface, the deposits are thick, and the ore is but loosely cemented and consequently can easily be scooped up with steam or electric shovels without preliminary blasting. These conditions favor the maximum use of mechanical power and machinery, resulting in a large output of ore to each laborer. In some of the deep-shaft mines of Lorraine, France, where machinery and power cannot be used with the same facility, since the deposits lie so far beneath the ground, the annual output to each laborer is less than a third that of the Minnesota district.

2. The graf map at the top of page 41 in Goode's Atlas shows that the country leading in ...., most of which are ...., is the country of .....

3. The graf map at the bottom of page 30 in Goode's Atlas shows that ..... is the chief cotton producing country, with most of the production in the ..... part of the country; that ..... is the chief flax growing country, with production mostly in the ....part of the country; and that .... is the leading jute producing country, all of the jute being produced in the ..... part of the country.

4. Write a description of Area X, picturing the landscape as you visualize it after consulting the following sources of information in Goode's Atlas:
   a. The map at the top of page 65
   b. The map at the bottom of page 63
   c. The map at the top of page 63
   d. The map at the bottom of page 62
   e. The map on page 44

f. The map on page 85
g. The map at the top of page 64
h. The map on page 68 and left half of page 69

5. Write two geographic relationships from the following paragraph:

In the northern part of the Great Plains region heavy snows, which cover some of the cattle ranges for limited periods, interrupt winter grazing and necessitate feeding to prevent or reduce losses. It is also customary among many northern producers to supply feed in connection with winter grazing, especially when the range is short thru insufficient fall rains. The southern portion of the region is more nearly a year-long grazing zone, owing largely to the lack of snowfall. However, feed is often supplied during periods of range shortage, both in summer and winter, especially during the long drouths that are more or less periodic.

6. Maps A and B show that in Arizona the acreage of .... is greater than the acreage of ....

7. a. What is the significant fact brought out by the figures for the approximate world total? (Water power statistics)
   What problem does this fact raise?
   b. What is the significant problem brought out by the figures for Africa?
   c. What is the significant problem brought out by the figures for North America and Europe?

8. a. What is the striking fact about the states of Minnesota, Michigan and Alabama brought out by the graf?
   b. What is the striking problem shown for the state of Minnesota, alone?

9. What contrast does the map show between eastern and western United States?

10. In the solid black areas on the dot map showing the distribution of corn acreage, corn is probably
    ..... the only crop
    ..... one of several crops } grown

11. What geographic relationship is shown in picture X?

12. What problem is suggested by picture Y?

ANNUAL MEETING NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

The next meeting of the National Council of Geography Teachers will be held in Syracuse, N.Y., Tuesday, December 29 and Wednesday, December 30. Headquarters and meetings will be in Hotel Syracuse. Single rooms with bath run from $2.50 up; double, $4.50 up. Reservations should be made in advance as other meetings are being held in the same city at the same time.

The National Council invites all geography teachers to come to its annual meeting, to gain from its program help in subject matter and method, to share the inspiration which comes from a large group of men and women working together for a common cause, to contribute to the discussions and the plans for future work.

TENTATIVE PROGRAM

Tuesday, December 29, 9:00 A.M.

Greetings from Syracuse: George B. Cressey, Department of Geology and Geography, Syracuse University.

Response: L. C. Davis, Department of Geography, State Teachers College, Indiana, Pa.

Geography of the Syracuse Region: Sidman P. Poole, Department of Geography and Geology, Syracuse University.

You and Your Natural Environment: Cora P. Sletten, Department of Geography, State Teachers College, Mankato, Minn.

Geography Requirements for State Certification of Teachers: Isabelle Kingsbury Hart, Teachers College, Oswego, New York.

Tuesday, December 29, 2:00 P.M.

The Use of Standardized Tests: Harry P. Smith, Syracuse University.

International Bibliography of Geographer's Materials: Erna Grassmuck Gilland, California, Pa.

A Study in Spatial Orientation of Children: F. E. Lord, Department of Education, Michigan State Normal College, Ypsilanti.

Objective Testing in Geography at College Level: Ralph Brown, Department of Geography, University of Minnesota.

Steps in Construction of the National Council Geography Tests (By two members of the Council Committee): Zoe Thralls, College of Education, University of Pittsburgh, and, Marguerite Uttley, Department of Science, Iowa State Teachers College, Cedar Falls, Iowa.

Tuesday, December 29, 8:00 P.M.

Incidents of an Amazonian Traverse (Illustrated): Robert S. Platt, Department of Geography, University of Chicago.

Wednesday, December 30, 9:00 A.M.

Attributes of Place: W. Elmer Ekblaw, Geography Department, Clark University.

The Guayaquil Lowland (Illustrated): Harriet Carter, Frick Training College, Pittsburgh, and, Alice Foster, University of Chicago.

The City of Lowell in 1936: Margaret Parker, Department of Geology and Geography, Wellesley College.

Wednesday, December 30, 2:00 P.M.

Conservation in a Semi-arid Region: Nora Zink, Geography Department, State Teachers College, Indiana, Pa.

Soil Conservation: Helen M. Strong, Soil Service, Washington, D.C.
National Planning of Water Resources: Gilbert White, National Resources Board, Washington, D.C.
Forestry and the Public Schools: George A. Duthie, Forest Service, Washington, D.C.

Wednesday, December 30, 6:00 P.M.

Annual Dinner.
Presentation of the Distinguished Service Award.
Reshaping the Map of Africa: Derwent Whittlesey, Department of Geography, Harvard University.

THE THIRTY-THIRD ANNUAL MEETING OF THE ASSOCIATION OF AMERICAN GEOGRAPHERS

The thirty-third annual meeting of the Association of American Geographers will be held in Syracuse, N.Y., on December 31, 1936, January 1, 2, 1937. Headquarters of the Association, as well as all the sessions, will be in the Hotel Onondaga.

A varied program of significant papers is promised. One session will be devoted to a symposium on geographical exploration, in which a number of men of international prominence in this traditional branch of geography will take part. Another series of papers will deal with the classification and the use of soils. All divisions of the "geographical sciences" will be represented by reports setting forth the results of research studies still in progress or recently completed. The presidential address will be given by Professor William H. Hobbs on the occasion of the annual banquet. This, it seems probable, will be held on the last evening—Saturday, January 2. Those who must return to their homes in time for Monday morning classes will find that the excellent train service at Syracuse will permit them to start after the conclusion of this important part of the program.

Persons interested in any phase of geographical work, whether or not they are members of the Association, are cordially invited to attend these meetings. Only one session—an evening round table discussion of problems in the cultural geography of North America—is limited to members only. All the other meetings, including the banquet, are open to all interested persons, altho, in general, only the members are expected to take part in the discussions. Non-members who have significant results of research studies to present may be introduced by any member of the Association.

Another feature of the meetings will be a display of maps. A special room will be reserved for this exhibition in which members, or non-members who have been introduced, may show the cartographic results of their research studies. It is customary, also, for

the chief map publishing houses to arrange displays of the latest wall maps.

The officers of the Association hope that a considerable number of the members of the National Council of Geography Teachers, and other interested persons, will attend its thirty-third annual meeting.

PRESTON E. JAMES
Secretary of the Association
Ann Arbor, Michigan

GEOGRAPHICAL PUBLICATIONS

C. T. Madigan. **Central Australia.** 267 pp., 15 illustrations, two folded maps. Oxford University Press, New York. 1936. $5.00

The author, a geologist of repute, presents first an outline of the early exploration of Central Australia, then an account of his own extensive and more recent journeys by rail, automobile, plane and camel. His avowed purpose is to convey "the color and glamor of this vast lonely inland region and its people" to depict, "the greyness, age, loneliness, stillness and above all peace" of what Gregory called "The Dead Heart of Australia." He succeeds.

In describing his own travels he presents new, interesting and significant facts about cultural and natural environmental factors of the region not previously available to most students. As a case in point, his descriptions and pictures of the lack of water in Lake Eyre are particularly significant, since we are accustomed to seeing it colored with the symbolic blue of permanent waters on many maps.

The style is pleasant and informal and the treatment suited to the general reader save in a few spots where this trained geologist lapses into professional patter.

The pictures, apparently from photographs by the author, are so enlightening that one wishes there were many more. The two maps give locations of places mentioned in the text, and the routes of the explorers.

Altho apparently intended for adults interested in travel, exploration and adventure, the book would be usable in most part at junior high school level. It is a definite contribution to the literature on a little known region.

State Teachers College
Indiana, Pennsylvania
L. C. DAVIS

Louise A. Boyd. **The Fiord Region of East Greenland.** xii and 369 pp., with maps, grafs, and a wealth of superior illustrations and an adequate index. The American Geographical Society, N.Y. 1935

Tho geographers no longer confine their field to exploration and discovery, as not so many decades ago they were wont to do, they still find great interest in such accounts of exploratory expeditions as this recent volume constitutes, from the press of the American Geographical Society. It presents the narrative by Miss Boyd of her expedition in 1933 to Franz Josef and King Oscar Fiords, and the results of scientific studies by the staff which she had elected to take with her. It forms one of the latest contributions to our knowledge of Polar Lands.

Within the last half century, or somewhat longer, the Danes have been engaged in an excellent series, comprising hundreds of volumes of scientific studies bearing upon the exploration, geography, anthropology, and nature of Greenland, entitled "Meddelelser om Grønland" which constitutes a most comprehensive and varied body of knowledge

regarding that fascinating land on the Arctic frontier of human habitation; but unfortunately this superb series is available in only a few of our largest American libraries, and consequently not at the disposal of most of our geographers. Most of the authoritative publications on Greenland are similarly unavailable, or are so expensive as to preclude the possibility of their purchase by the geographer of ordinary means.

Because it conveys to the geographers of our country some appreciation and knowledge of the character and picturesqueness of the Greenland terrain, this book, which the American Geographical Society has published in such excellent form, constitutes an extremely valuable addition to our libraries. It affords, within the reasonable limits of a geographer's purse, the opportunity for him to acquaint himself with the distinctive landscape that makes the shores of far Arctic lands so alluring and so interesting. It supplies him a wealth of photographs whereby he can see in illustration the many peculiar features of Arctic scenery with which, because of their inaccessibility, he cannot become personally acquainted. The volume is richly illustrated with remarkably clear, highly informative photographs of vistas and panoramas, which are nearly all from Miss Boyd's camera, of the whole East Greenland coast that her expedition explored. The descriptive text is wellnigh superfluous, so well do the photographs portray the appearance of the land and its physical attributes, but the text is indispensable when it engages in interpretation of the causes of the land forms, and the processes by which they have been produced.

Besides Miss Boyd's narrative the book includes sections by Dr. J. Harlen Bretz, University of Chicago, who accompanied the expedition as physiographer; O. M. Miller and Walter A. Wood, surveyors, who present the photogrammetrical work of the expedition; William B. Drew, Assistant Botanist of the Gray Herbarium, Harvard University, who served as botanist and reports upon the collections and studies of plants; a study of the echo sounding records by Charles B. Hitchcock, and of the tide gauge recorded by O. M. Miller. Dr. John K. Wright of the American Geographical Society contributes an historical summary of exploration in that part of Greenland. A separate folder accompanying the volume contains a goodly number of valuable maps.

The volume is of much value in depicting the actual appearance and character of Arctic landscape, the high inhospitable shores, icebound for months, even years at a time, that form Greenland. It is bound in the distinctive, excellent, format that the American Geographical Society has made familiar among geographers, it is on superior paper and in clear legible type, and represents the kind of volume the geographer is proud to have on his shelves for frequent reference.

Clark University W. ELMER EKBLAW

S. Vere Pearson. **The Growth and Distribution of Population.** 448 pp., 20 illustrations. John Wiley and Sons. New York, 1935. $4.00

The geographer opens this volume predisposed in its favor because of its title, the publisher and the opening sentence which promises that "this is a book on human geography." The contents having been read, the inevitable conclusion is reached that the preparation of a geographically sound and useful study of the distribution of mankind is an important task yet to be performed. It is above all to be hoped that no one will mistake this for "a book on human geography."

Chapter 2 (Soil Fertility, Climate, Accessibility: Origin of Villages and Towns) provides a suitable opening but the chapter is entirely inadequate and contains numerous errors of fact. The objectivity of treatment found in the earlier chapters suddenly ceases in Chapter 6: "Law and Custom in Africa: the Magic Instrument," and in succeeding chapters the interpretation of highly controversial matters is colored by strong biases of the author. "The magic instrument," it appears, is the communal ownership of inalienable lands of certain west African tribes, a happy situation which is reflected in "the tranquillity and commercial prosperity of northern Nigeria's many millions." Kenya tribes, on the other hand, throttled by the institution of freehold under British rule, are in a pitiable condition. This is but the opening gun of a series of broadsides appearing in

succeeding chapters, designed to prove that the institution of private ownership in land, the collection of monopolistic rents by mercenary landlords and the imposition of taxes on real property are responsible for many if not for all of the world's present problems, and prevent a natural spreading out of the world's population. Thus the author is convinced that "it is the throttling effect of private ownership of natural resources . . . which is at the bottom of the failure of settling people on the land in Australia." Adversities of climate, soil and "contour" are recognized as causing blank areas on the population map of the world but natural environment is said to become less important as civilization advances. A very considerable part of the book is simply a restatement of the single tax theories of Henry George of whom the author reveals himself as a disciple.

The reader of this volume must be prepared to take a devious tho often interesting journey stopping to investigate such topics as the functions of governments, traffic problems, procreation (including the case histories of "Lilly B." and "Sheila Y."), garden cities, rural depopulation, the problems of white Australia, the thoughts of a woman writer journeying in the rush hour thru a New York subway and "cooperation and the commonweal," the title of the concluding chapter. Let the economist again attack the single tax theory, unless this subject is considered altogether too shopworn in these days; geography teachers will find plenty of errors more closely related to human geography. "The soils of many vast desert areas are really amongst the most fertile of all," "the British Isles . . . have a climate well suited to the cultivation of wheat," and "the size of the piece of land that any particular occupier holds depends upon the nature of the cultivation he practices," are random samples of numerous statements of doubtful validity. Carelessness is also reflected in the constant reference to a prominent American geographer as "E. Huntingdon." Similarly it is probably to Professor Griffith Taylor that the author refers as "Gilruth-Taylor."

The volume contains 19 maps, of which series the only world map (occupations of mankind) is scarcely legible. Nearly half of the maps are city plats and eight are of England or of British cities. Just as Henry George drew his illustrations for his *Progress and Poverty* from city life, so this author reaches safer, and apparently more familiar ground, when he discusses cities. Thus Chapters 10, 17 and 20 represent the higher points of the book.

University of Minnesota RALPH H. BROWN

Ernst Sorge. **With Plane, Boat, and Camera in Greenland.** 255 pp., insets with 196 photographs reproduced in blue. D. Appleton-Century Co., New York and London. 1936. **$5.00**

"Mit Flugzeug, Faltboot, und Filmkamera in den Eisfjorden Grönlands," is now in imperfect English, but readable and valuable to geographers. Sorge details adventures of the Laemmle equipped Fanck Expedition sent to film "S O S Iceberg" and a comedy, along Greenland west coast. Sorge studied glaciers, especially Rink, whose 600 to 700 meter high front stands unsurpassed. "Rink Gletscher" moves forward some forty times as fast as Alps valley ice, as much as twenty-seven meters daily in its middle portion, into Kangerdluk Fiord where soundings read to 1123 meters, depths approaching those of Sogne and west Patagonian fiords. Sound pictures taken showed individual calvings to perhaps 700,000,000 cubic meters of ice into deep water off the Rink front. Resultant waves, raising fiord waters to seven meters above usual level, cost the expedition one boat and at times crushed natives against the rock walls.

Knud Rasmussen arranged for the German adventurers with Danish administrators and with native kayakers. Many Eskimo boatmen suffer giddiness, hence never venture alone on fiords. Since very few swim, Sorge estimates that each eighth man dies in his skin canoe. Natives necessarily harpoon expertly as summer lean seals will not remain afloat after death.

Despite great risks taken by the Fanck group one wonders whether the numerous wives and secretaries would have survived the rigors of an earlier generation of explorers

lacking "flit" to combat gnats. One perhaps revises notions of Arctic fauna on reading that the polar bears for filming went from Germany out of Hagenbeck surplus.

GEO. H. PRIMMER

State Teachers College
Duluth, Minnesota

Agnes Rothery. **Finland, The New Nation.** 257 pp., 32 illustrations. The Viking Press, New York. 1936. $3.00

Miss Rothery presents one of the best books on Finland written in the English language. It is to be highly commended. The literary style is direct, simple yet attractive, and the interest of the reader is maintained thruout. Altho this volume is not offered as a geographic treatise on Finland, so much of the geographic element has been touched upon that geographers desirous of informing themselves relative to this unique northern republic will find in its content considerable material of professional value. Such chapters as The Finns in the Lake Region, The Lapps in the North, Discoveries of the Arctic, Nationalism in Forest and Farm, and Åland and the Last of the Sailing Ships, have a splendid geographic ring.

The author recognizes the difficulties of translating the atmosphere of Finland into such literary terms as will convey to the reader an accurate appreciation of the landscape and the cultural activities of the people. Indicating the desirability of seeing the country at first hand, she says:—"One must let her (Finland) unroll her own forests and introduce her own people. . . . She will create her own impression and tell her own story which is, after all, the most agreeable way for strangers to come to know it." Miss Rothery's book may be recommended to teachers of geography seeking good supplementary reading material on Finland and may be urged upon those anticipating a visit to that region.

An appendix includes a list of important geographic names with Swedish and Finnish forms, a few statistical data and a good bibliography. Illustrations are affectively chosen and mechanically well reproduced.

Ohio State University EUGENE VAN CLEFF

Earl B. McKinley. **A Geography of Disease.** 510 pp. George Washington University Press, Washington, D.C. 1935

This treatise by a dean of a large school of medicine discusses the distribution of some eighty diseases classed as "tropical" and of thirty-two diseases "usually considered as of temperature climates." For fifteen selected American states (in the South) the presence, distribution, approximate number of cases and the importance of each of these diseases, so far as they occur, is given. This is followed by a similar discussion of disease in the American dependencies, the Philippines receiving special attention. The next 200 pages of the treatise deal with the British Empire, giving for each of the tropical colonies and dependencies corresponding detailed information, together with brief introductory remarks as to population, chief activities, and recent changes in the incidence of the more important diseases.

Part IV treats similarily of the tropical and sub-tropical possessions of France, the Netherlands, and other countries (140 pages). Part V (85 pp.) gives summaries for selected diseases, consisting of short articles by eminent medical authorities on each of the twenty chief diseases, and tables for fourteen other diseases which are most serious and widespread in the tropical and sub-tropical regions. The appendix (40 pp.) gives supplementary notes on diseases in various areas, especially French and British colonies.

This scholarly work, with its more than 160 tables and vast body of other data, affords many reliable data on the distribution of disease in the warmer two-thirds of the world.

Indiana University STEPHEN S. VISHER

The JOURNAL *of* GEOGRAPHY

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A Cultural Landscape in Ancient Brittany. By Sidman P. Poole ... 333

Dr. Poole is an associate professor of geography at Syracuse University, Syracuse, N.Y., and a frequent contributor to geographical literature. He served in Brittany during the World War and continued field work in the area in 1925 and 1928. In 1930-31 he served as a geographer to the Syracuse Andean Expedition, and in 1933 to the Gaspe Expedition.

This is the fourth article in our series on Europe.

An Hacienda in Mexico. By Ben F. Lemert and Rose V. Lemert ... 343

Dr. and Mrs. Lemert of Duke University continued their field studies in Mexico during the past summer. Other articles in the series were published in 1935 and 1936.

Valley Contrasts in the Missouri Ozarks Region. By Margaret Riggs 351

Miss Riggs is an instructor in geography in the college high school, State Teachers College, Cape Girardeau, Mo.

An Experiment in Individual Versus Group Study of Pictures in Geography. By Elizabeth Stadtlander 360

Miss Stadtlander is a sixth grade critic teacher in the State Teachers College, Slippery Rock, Pa. The experiment discussed in this paper was carried out in Midland, Pa.

A Story of One Day in Huntsville, Texas. By M. J. Fields 364

This story was written by Miss Fields while a student at the Sam Houston State Teachers College.

Uses of Rivers to Man. By Virginia Willcuts 367

Miss Willcuts is supervisor of the third and fourth grades in the Training Department of the State Teachers College, Duluth, Minn.

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